

REMARKS

Claims 47-62 are pending in the present application. Claims 47-51 and 57-62 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over various claims of US Patent No. 6,392,488. Claims 52-56 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over various claims of US Patent No. 6,392,488 in view of Vernon 6,188,274. Claims 47-62 have been rejected under § 103 as being unpatentable over Koinuma 4,451,802 (Koinuma) in view of King 6,300,827 (King), Engbretson 5,311,150 (Engbretson), Dudley et al. 5,144,133 (Dudley) and Mandelman et al. 6,355,531 (Mandelman).

The Examiner has indicated that he is waiting for an indication of whether the previously submitted terminal disclaimer is acceptable. Applicants will therefore not address the double patenting rejections again.

As mentioned above, claims 47-62 have been rejected under § 103 as being unpatentable over Koinuma in view of King, Engbretson, Dudley and Mandelman. The Examiner has taken the position that it would have been obvious to combine the teachings of these 5 references, and that such a combination makes the claims unpatentable. In the Office Action, it is alleged that the claimed invention is made unpatentable by the combination of Koinuma (a power amplifier having multiple stages), King (a power amplifier for a wireless transmission system), Engbretson (a FET), Dudley (CMOS), and Mandelman (a semiconductor having different oxide layers).

Claim 47 recites a dual gate oxide CMOS RF power amplifier for a wireless transmission system including "RF power amplifier input stage circuitry including devices with a first gate oxide thickness," "RF power amplifier output stage circuitry having devices with a second gate oxide thickness," and "wherein the first gate oxide thickness is less than the second gate oxide

thickness, and wherein the first gate oxide thickness is related to desired breakdown voltage levels of devices in the input stage circuitry and the second gate oxide thickness is related to desired breakdown voltage levels of devices in the output stage circuitry."

Claim 52 recites a cellular telephone apparatus including "a transceiver for transmitting and receiving signals," "a complementary metal oxide semiconductor (CMOS) RF power amplifier coupled to the transceiver, the RF power amplifier having input stage circuitry including devices with a first gate oxide thickness and output stage circuitry having devices with a second gate oxide thickness, wherein the first gate oxide thickness is less than the second gate oxide thickness, and wherein the first gate oxide thickness is related to desired breakdown voltage levels of devices in the input stage circuitry and the second gate oxide thickness is related to desired breakdown voltage levels of devices in the output stage circuitry," and "an antenna coupled to the RF power amplifier and the transceiver for transmitting and receiving signals."

Claim 57 recites a method of providing a CMOS RF power amplifier for a wireless transmission system including "providing an input stage including one or more devices having a first gate oxide thickness," "providing an output stage including a plurality of switching devices having a second gate oxide thickness," and "selecting the thickness of the first and second gate oxides such that the second gate oxide thickness is greater than the first gate oxide thickness, wherein the first gate oxide thickness is selected based on desired breakdown voltage levels of devices in the input stage and the second gate oxide thickness is selected based on desired breakdown voltage levels of devices in the output stage."

Applicants assert that amended independent claims 42, 52, and 57, as well as the claims depending therefrom are allowable over the cited prior art. There is no suggestion or motivation in the 5 references to combine the teachings of the references as outlined in the Office Action.

For example, there is nothing in the Koinuma reference to suggest that input and output stage circuitry having devices with different gate oxide thicknesses would be desirable. Furthermore, there is no teaching in any of the cited references to select different gate oxide thicknesses in a CMOS RF power amplifier, based on desired breakdown voltage levels in various different devices. As stated in the Specification:

"The RF amplifier of the present invention takes advantage of the availability of dual gate oxide devices by selectively choosing certain gate lengths for various components of the amplifier. For example, it has been discovered that for preprocessing circuitry or pre-driver circuitry, a high speed is desirable and breakdown voltage is not as important. Therefore these devices are designed using a thinner gate oxide. For output stage devices, where a high breakdown voltage is more important, the devices are designed using a thicker gate oxide." (Specification, Page 28, lines 18-24).

Note that, there are tradeoffs to selecting one gate oxide thickness over another. For example, in typical RF designs, it is often desirable to use the fastest and most efficient devices possible. This would tend to make a designer use the smallest gate oxide thickness available (since thin gate oxide devices are typically faster and more efficient). It may seem counter intuitive to use larger than available gate oxide thicknesses in an RF power amplifier. However, by following the teachings of the present application, a CMOS RF power amplifier can be designed with some devices utilizing the "less desirable" thicker devices. By carefully selecting the gate oxide thicknesses, a resulting design can have advantages over other devices (e.g., having certain devices with higher breakdown voltages).

For at least these reasons, applicant asserts that independent claims 47, 52, and 57 are allowable over the prior art.

Conclusion

It is respectfully submitted that all claims are patentable over the prior art. It is further more respectfully submitted that all other matters have been addressed and remedied and that the

application is in form for allowance. Should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Bruce A. Johnson, Applicants' Attorney at 512-301-9900 so that such issues may be resolved as expeditiously as possible. Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 to deposit account number 50-3864 (Johnson & Associates).

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Date

Respectfully Submitted,



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